

## REMARKS/ARGUMENTS

The Applicants have respectfully added Claims 34-48 without introducing new matter.

### Claim rejections 35 U.S.C. § 103

Claims 1-2, 6-12, 16-22, and 26-33 are rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Takahashi, et al. U.S. Pub. No. 2001/0024859 (hereinafter Takahashi). The Applicants respectfully traverse the rejection in view of the following.

Independent Claim 1 recites a limitation whereby a plurality of conductive sub-surface regions are formed beneath the surface of the semiconductor for routing a body-bias voltage, as claimed. Moreover, independent Claim 1 recites a limitation whereby an isolation structure is formed within the perimeter of the sub-surface, as claimed. Furthermore, independent Claim 1 recites a limitation whereby at least one metal structure spans the gap formed by the isolation structure, as claimed.

In contrast, Takahashi discloses semiconductor regions 22nb, 23nb and etc. of respective MOSs (see Takahashi, paragraph 205). The semiconductor regions 22nb, 23nb and etc. are placed above the P-type well, PWm, N-type well, and the semiconductor substrate 1 (see Takahashi, Figure 49). Accordingly,

semiconductor regions 22nb, 23nb and etc. are formed above the P-type well, N-type well and the semiconductor substrate. Therefore, Takahashi fails to teach or suggest a plurality of conductive sub-surface regions formed beneath the surface of the semiconductor, as claimed.

Moreover, Takahashi discloses trench type isolation areas SGI which is adjacent to the semiconductor regions 22nb, 23nb and etc. (see Takahashi, Figure 49). The Applicants do not understand two structures that are adjacent to one another to be equivalent to a first structure formed within the perimeter of a second structure. Accordingly, Takahashi fails to teach or suggest an isolation structure formed within the perimeter of the sub-surface, as claimed.

Furthermore, Takahashi discloses trench-type isolation areas SGI and active areas Lm surrounded by the isolation areas SGI that are formed in the principal surface of the semiconductor (see Takahashi, paragraph 188). Accordingly, a first level wiring metal layer L1 is surrounded by the isolation areas SGI. Therefore, Takahashi fails to teach or suggest at least one metal structure spanning the gap formed by the isolation structure, as claimed because Lm is inoperable to span the gap created by the SGI when Lm is surrounded by the SGI as disclosed by Takahashi.

The rejection asserts that since Takahashi teaches “conductive sub-surface regions as claimed, it is capable of routing a body-bias voltage.” As discussed above, Takahashi fails to teach or suggest the conductive sub-surface regions in the claimed fashion. Accordingly, Takahashi is incapable of routing a body-bias voltage in the claimed fashion.

Furthermore, the Applicants respectfully submit that the structure disclosed by Takahashi is inoperable for routing a body-bias voltage in the claimed manner. Takahashi discloses that semiconductor regions 22nb, 23nb and etc. are placed above P-type well, PWm (see Takahashi, Figure 49). Semiconductor regions 22nb, 23nb and etc. are further adjacent to semiconductor regions 22na, 23na and etc. as well as isolation areas SGI (see Takahashi, Figure 49). Moreover, semiconductor regions 22nb, 23nb and etc. are below the L1 metal structure as well as insulating films 12a and 12b (see Takahashi, Figure 49).

As such, the semiconductor regions 22nb, 23nb and etc. are enclosed by P-type well PWm, semiconductor regions 22na, 23na and etc., isolation areas SGI, L1 metal structure and insulating films 12a and 12b. The enclosure of the semiconductor regions 22nb, 23nb and etc. renders the semiconductor regions 22nb, 23nb and etc. inoperable for routing body-bias voltage in the claimed fashion because of its physical limitations due to the enclosure. Therefore,

Takahashi fails to teach or suggest sub-surface structure for routing a body-bias voltage, as claimed and teaches away by showing the semiconductor regions 22nb, 23nb and etc. enclosed and inoperable for routing the body-bias voltage in the claimed fashion.

Moreover, the Applicants wish to remind the Examiner that to establish a *prima facie* case of obviousness the prior art reference (or references when combined) must teach or suggest all the claim limitations (see MPEP 2100-126). The mere fact that a structure is capable of certain operation does not explicitly teach or suggest that operation. Accordingly, *assuming arguendo* that Takahashi is capable of routing a body-bias voltage as suggested by the rejection, such capability fails to explicitly and sufficiently teach or suggest sub-surface structure for routing a body-bias voltage, as claimed.

Accordingly, Takahashi fails to teach or suggest the limitations of independent Claim 1. As such, Takahashi fails to render independent Claim 1 obvious, under 35 U.S.C. 103(a). Independent Claims 11 and 21 recite limitations similar to that of independent Claim 1 and are patentable for similar reasons. Dependent claims are patentable by virtue of their dependency.

As per Claims 2 and 22, the rejection asserts that Takahashi teaches sub-surface structure that is a diagonal sub-surface mesh structure. The Applicants

have review Takahashi and its relevant disclosure of Figures 19a and 20a and their corresponding text portion. However, the Applicants do not understand Takahashi to teach or suggest a diagonal sub-surface mesh structure as suggested by the rejection.

Moreover, the Applicants wish to respectfully remind the Examiner that “the examiner should set forth in the Office Action: (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate” and “(B) the difference or differences in the claim over the applied reference(s)” (see MPEP §706.02(j)). As such, a mere assertion that Figures 19a and 20a teach the sub-surface structure that is a diagonal sub-surface mesh structure does not provide the Applicants sufficient guidance as to the relevant teachings of the prior art relied upon as required by the MPEP (e.g., with column and line number references), nor does it set forth the difference or differences in the claim over the applied reference. Therefore, the Applicants respectfully request appropriate correction to the rejection pertaining to Claims 2 and 22 in the present application.

As per Claims 9, 19, 29, 30 and 31, the rejection admits that Takahashi fails to teach the metal structure is metal or polysilicon or diffusion or silicide wire. However, the rejection asserts that the connection between sub-surface regions

by a metal or polysilicon or diffusion or silicide wire is well-known. The Applicants respectfully disagree and interpret the assertion as an Official Notice.

The Applicants respectfully direct the Examiner to MPEP §2144.03(A), which states that “[i]t is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based” (see *Zurko*, 258 F.3d at 1385, 59 USPQ2d at 1697). Moreover, the Applicants respectfully remind the Examiner that in support of an Official Notice the Examiner must point to some concrete evidence in the record in support of these findings to satisfy the substantial evidence test (see MPEP 2144.03(c)). If the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding (see 37 CFR 1.104(d)(2) and see MPEP 2100-144).

As per Claims 10, 20 and 32 the rejection relies on semiconductor region 23nb of Takahashi to show a second conductive sub-surface region that overlaps the sub-surface structure, as claimed. The Applicants respectfully traverse because the semiconductor region 23nb is separate and not connected to the semiconductor region 22nb (see Takahashi, Figure 49). Accordingly, Takahashi fails to teach or suggest a second conductive sub-surface region that overlaps the sub-surface structure, as claimed.

As such, allowance of Claims 1-2, 6-12, 16-22, and 26-33 is earnestly solicited. Moreover, newly added claims 34-48 are patentable and their allowance is earnestly solicited by virtue of their dependency.

For the above reasons, the Applicants request reconsideration and withdrawal of rejections under 35 U.S.C. 103(a).


### CONCLUSION

In light of the above listed remarks, reconsideration of the rejected Claims 1-2, 6-12, 16-22, and 26-33 is requested. Based on the arguments presented above, it is respectfully submitted that Claims 1-2, 6-12, 16-22, and 26-33 overcome the rejections of record and, therefore, allowance of Claims 1-2, 6-12, 16-22, and 26-33 as well as newly added Claims 34-48 is earnestly solicited.

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